

Rules of differentiation

Rule	$f(x)$	$\frac{df}{dx}$
	c	0
	x^n	nx^{n-1}
	$cu(x)$	$c \frac{du}{dx}$
Sum rule	$u(x) + v(x)$	$\frac{du}{dx} + \frac{dv}{dx}$
Product rule	$u(x) \cdot v(x)$	$\frac{du}{dx} \cdot v(x) + u(x) \cdot \frac{dv}{dx}$
Quotient rule	$\frac{u(x)}{v(x)}$	$\frac{\frac{du}{dx} \cdot v(x) - u(x) \cdot \frac{dv}{dx}}{(v(x))^2}$
Chain rule	$y(u(x))$	$\frac{dy}{du} \cdot \frac{du}{dx}$
Leibniz rule	$\int_{a(x)}^{b(x)} f(x, t) dt$	$\int_{a(x)}^{b(x)} \frac{df}{dx}(x, t) dt +$ $f(x, b(x)) \frac{db}{dx} - f(x, a(x)) \frac{da}{dx}$